From: Thomas Cooper [Tom.Cooper@intusurg.com]
Sent: 5/24/2011 6:25:07 PM
To: David Larkin; Marc Tognaccini [Marc.Tognaccini@intusurg.com]; David Long
CC: David Shafer [Dave.Shafer@intusurg.com]; Chris Anderson [Chris.Anderson@intusurg.com]; Tabish Mustufa [Tabish.Mustufa@intusurg.com]; Anthony McGrogan [Anthony.McGrogan@intusurg.com]
Subject: RE: RFID Tag

I believe what we decided in our staff meeting today was:
1. As a preliminarily decision, do not use the hardware security items to gate whether we use the Baylogh tag or not. We need to at least make sure that someone can't just copy the contents of a tag from a new instrument and reprogram it at the end of life with that same information.
2. Continue on a parallel path with the Atmel tags in case Baylogh doesn't work out. Initially, I'm hoping this is looking for the stressor that is causing the failures, so that this can be exaggerated to cause failures at a high rate, so that we can stress proposed designs at a small sample size to settle on a design that we then test at a larger sample size.

Tom C.

-----Original Message-----
From: Thomas Cooper
Sent: Monday, May 23, 2011 6:09 PM
To: David Larkin
Cc: David Shafer; Chris Anderson; Tabish Mustufa; Anthony McGrogan
Subject: RFID Tag

Dave,

We will need to do some work on the RFID tag and reader. This is based on Sara's testing and attending meetings about the tag with Marc T, David Long, Orion and instrument team members.

There are two problems with the Atmel tag we are using now:
1. The tag has a failure rate of a few percent, probably from autoclaving.
2. Atmel used to be very helpful to us, but after some layoffs, is not helpful now.

We can work on ruggedizing the tag ourselves and testing the results.
1. We would need to design a ruggedizing method; we had a brainstorm to think of various ways.
2. This will take a long time. To run the autoclave cycles last time, Sara spent 5 continuous weeks. This would be in addition to design and manufacture of test pieces.
3. The result may or may not work, as the failures may be intrinsic to that tag design or manufacture, or they could be caused by the way we've been mounting them.

Tyler Morissette from Connecticut is trying to find a universal tag for ISI to be used for Orion instruments, Orion cannulae, and Ducati instruments. He talked to many companies, and found a company Baylogh that makes an inexpensive, autoclavable packaged tag, but there are some pluses and minuses:
1. The packaged tag makers don't actually make the chips inside or even the antennas; they buy them. None that Tyler talked to want to work with Atmel. Atmel makes the chips and antennae, but doesn't package them.
2. Baylogh tags are used in a Stryker instrument according to a Stryker alumnus, which is good.
3. The interface standard is different. We are using ISO-14443-B while Baylogh and others request we use ISO-15963 4. There aren't as many security features. The Atmel has even more hardware security features than the Dallas chips. Some in ISI feel this is important, others don't. This is where I would especially like your opinion. The Dallas has areas that can be decremented for life counting but not restored, and I think the Atmel does too. Atmel also manufactured special chips for us with UID. As I weakly understand it, the use of the new standard would rely on software encryption, or perhaps nothing at all, as Rod Vance proposes. Other people such as Ted Walker, Sundstrom, etc may disagree. Rod plans to ask Sal for a decision about whether encryption is needed. Ted said the most important thing is to prevent people from reprocessing our instruments, which is more likely than people making knockoffs.
5. Our 64kbit requirement is a bit unusual. Baylogh can meet that in a small form factor suitable for Ducati and Orion if the 15963 standard is used.

Some suggest continuing on a parallel path with Atmel for Ducati, perhaps changing later during development or production.

My take is we should quickly figure out whether the Baylogh would be suitable or not on a theoretical basis first, perhaps with security as the most urgent, and if it looks positive, not develop Atmel any more, but I don't understand all the issues and am probably misinterpreting some.

Tom C.